Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
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Research Seminar

Offloading Cellular Traffic through Opportunistic Communications: Analysis and Optimization
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12-1pm Monday 5Th Oct 2015

Abstract: Offloading traffic through opportunistic communications has been recently proposed as a way to relieve the current overload of cellular networks. Opportunistic communication can occur when mobile device users are (temporarily) in each other's proximity, such that the devices can establish a local peer-to-peer connection (e.g., via Bluetooth). Since opportunistic communication is based on the spontaneous mobility of the participants, it is inherently unreliable. This poses a serious challenge to the design of any cellular offloading solutions, that must meet the applications' requirements. In this work, we address this challenge from an optimization analysis perspective, in contrast to the existing heuristic solutions. We first model the dissemination of content (injected through the cellular interface) in an opportunistic network with heterogeneous node mobility. Then, based on this model, we derive the optimal content injection strategy, which minimizes the load of the cellular network while meeting the applications' constraints. Finally, we propose an adaptive algorithm based on control theory that implements this optimal strategy without requiring any data on the mobility patterns or the mobile nodes' contact rates. The proposed approach is extensively evaluated with both a heterogeneous mobility model as well as real-world contact traces, showing that it substantially outperforms previous approaches proposed in the literature.

Short Bio: Prof Banchs is the head of the Wireless Networking Lab at University Carlos III of Madrid and Deputy director of the IMDEA Networks research institute. His research interests include the resource allocation, design of novel algorithms and performance evaluation of wired and wireless networks

Venue: Meeting Room, Dunlop-Oriel/CTVR.

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